

Hydraulic Testing Plan for Arimetco FMS Evaporation Ponds B and C

Introduction

At the request of the U.S. Environmental Protection Agency - Region 9 (EPA) and on behalf of Atlantic Richfield Company (ARC), Brown and Caldwell (BC) has prepared this Hydraulic Testing Plan (HTP) for the Arimetco Fluid Management System (FMS) Evaporation Ponds B and C, located on the Yerington Mine Site (Site). The ponds: 1) were designed by a subcontractor to the Nevada Division of Environmental Protection - Bureau of Corrective Actions (NDEP); 2) became operational in October 2013; 3) are each approximately 405 feet long and 120 feet wide, and cover a surface area of approximately 1.1 acres with a capacity of 1.7 million gallons (MG) with two feet of freeboard; and 4) are double lined with a primary liner composed of 60-mil thick high density polyethylene (HDPE) overlying a leak detection system and secondary 60-mil thick HDPE liner. The geo-net layer between the primary and secondary liners allows for drain-down solutions between the liners to flow to the leak detection sump.

FMS Evaporation Ponds B and C were not hydraulically tested (i.e., fill tested) after construction to assess the integrity of the primary liner. In February 2015, approximately 1,200 gallons of fluid were pumped from the FMS Evaporation Pond B leak detector. This condition was temporally associated with a wind storm at the Site. An inspection was conducted around the periphery of the pond after the leak detector activity, but no signs of visible damage were observed. EPA and NDEP visited the Site on March 2, 2015 to assess the pond condition, and requested this HTP.

General HTP Approach

Fill testing will require sequential filling of each pond to the freeboard level and monitoring the pond level transducer, the leak detector for fluid level and (if any) leak detector pumping. Testing of FMS Evaporation Pond C will require pumping from Pond B and the VLT Pond at rates of 300 gallons per minute (gpm). Subsequently, testing of FMS Evaporation Pond B will require pumping from Pond C and, as needed, from the VLT Pond. Filling of both ponds will be in 0.5-foot increments up to the freeboard level, and the volume of pumped fluids will be calculated at the beginning of each test based on the pond levels observed at those times. Approximately 10 working days are anticipated for completion of hydraulic testing for each pond (i.e. one month for testing both ponds). BC will summarize the fill test results in a format agreed to by ARC, EPA and NDEP.

Health and Safety

All work associated with the HTP will be performed in accordance with the revised Site Health and Safety Plan (HASP), ARC health, safety security and environmental (HSSE) requirements and a task-specific Work Risk Assessment (WRA). The WRA will be prepared to inform Site personnel of potential project hazards (including working around water), assign roles and responsibilities and detail site specific health and safety information and emergency response procedure.

Fluid Transfers

Fluids will be transferred using the existing Godwin HL80 diesel pump, which will be set up on the berm between Evaporation Ponds B and C. A discharge valve will be installed to the discharge pipeline for controlling flow and pressure to avoid cavitation and to keep the pump within its operating curve. All conveyance and suction pipelines used for the tests would consist of existing materials used to support FMS operational and maintenance (O&M) activities. After testing is completed, the fluid levels in Evaporation Ponds B and C and the VLT Pond will be restored to optimize evaporation during the remaining summer months (i.e., solutions from Pond B will be transferred back to Pond C and the VLT Pond).

Monitoring

The existing flowmeter (Shenitech Model STUF-300F) located on the Slot Pond Pump discharge pipeline will be used for monitoring transfer volumes and flow rates. The flow meter will be calibrated per manufacturer recommendation provided in the O&M manual and flow data will be recorded every one-minute using data logger (Omega Model OM-EL-USB-4). The flowmeter has an accuracy of +/- 1% of flow reading.

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Leak detection monitoring will use an Ultrasonic Water Level Meter (Omega Model LVU800) in the vault, and water level data will be stored in a data logger. The Water Level Meter has an accuracy of $\pm 0.2\%$ of span in air (i.e., water level surface to the instrument). In addition, as a back-up, a 100-gallon PVC graduated stock tank will be used to accumulate pumped solutions from the leak detector before it is pumped back into the pond.

Pond fluid levels will be monitored using existing instrumentation (TROLL 300), which will measure fluid level every five minutes. This pressure transducer has an accuracy of $\pm 0.1\%$ of full scale (35 feet). A rugged reader would be used for downloading the level data on a daily basis.

Pre-Test Inspection

A pre-test inspection will be carried out to make sure all equipment and instruments are operating successfully, as follows:

- (1) Check Leak Detection Sump pump and disengage float switch for manual operation.
- (2) Divert Phase III HLP flows from the pond being tested to the other Evaporation Pond or the VLT Pond.
- (3) Check the flowmeters to ensure they are calibrated and working properly.
- (4) Check the diesel pump for fuel and that the suction and discharge connections are properly secured.

Evaporation Pond Hydraulic Testing Steps

- (1) Transfer fluids from the VLT Pond to FMS Evaporation Pond C and raise the level in 0.5-foot increments (transfer volumes are expected to vary between 104,000 to 164,000 gallons depending on pond levels).
- (2) Record fluid depth before and after fluid transfer and fluid transfer volume on a field form.
- (3) After each increment, wait 24 hours and check the leak detector sump for pumped solutions, which will be recorded by the water level meter.
- (4) If no solution was pumped by the leak detection system, initiate the next fluid transfer to raise the pond level by another 0.5 feet.
- (5) If solution is found in the leak detection sump, pump the solution to the graduated stock tank and measure and record the volume pumped and the flow meter reading.
- (6) Follow Steps 1 through 5 until fluid levels approach the freeboard level.

Perform similar steps for Evaporation Pond B with fluid transfers to start from Pond C (and, subsequently, from the VLT Pond). If a significant precipitation event (i.e., the 25-year/24-hour storm event) occurs during the testing period, all Phase III HLP drain-down solutions would be diverted to the VLT Pond.

Data Analysis and Reporting

BC will analyze the fill test data and provide a written summary of our findings in a format agreed to by ARC, EPA and NDEP. Test results would identify the fluid level in the Evaporation Ponds where leak detection activity (if any) was observed and identify pond levels where future inspections and/or repairs may be needed.